

Methods and apparatus for reducing resource contention in parallel data backup processes that share a variety of resources in a computer environment to access target data to be backed-up. The target data is distributed among the backup processes based on an availability of one or more resources in the computer environment used by a backup storage system to access the target data. In one example, each data file of the target data is assigned to a particular backup process based on the availability of one or more resources and a total size of the target data. The data files of the target data are assigned to the backup processes such that each backup process backs-up a respective portion of the target data, and such that the collection of backup processes that make up a backup operation are completed in a shortened time as a result of reduced resource contention. The target data originally may be located, for example, in one or more host computer systems, one or more primary storage systems, other computer devices containing a storage medium, or combinations thereof.